METHOD OF MANUFACTURING AN ENDODONTIC INSTRUMENT

Abstract of the Disclosure

Method for manufacturing endodontic instruments having either helical or non-helical flutes. A method is provided for forming superelastic endodontic instruments having helical flutes, wherein a wire of superelastic material is formed into an instrument blank, and before twisting, the superelastic alloy is brought to an annealed state comprising a phase structure including a rhombohedral phase alone or in combination with austenite and/or martensite, or a combination of martensite and austenite. In this annealed state, the instrument blank is twisted at low temperature, for example less than about 100°C, and advantageously at ambient temperature to the final desired twisted configuration. The twisted instrument is then heat treated and rapidly quenched to a superelastic condition. A method is further provided for manufacturing endodontic instruments having either helical or non-helical flutes with hard surfaces and resilient cutting edges by either an EDM or ECM process, wherein material is removed from the instrument blank in the desired flute pattern. The EDM or ECM process disintegrates the surface material, and as it cools, at least a portion of the removed material re-deposits onto the surface being machined to form a recast layer having a surface hardness that is at least about 15% greater than the hardness of the material forming the instrument blank. A method is further provided in which an EDM or ECM process is used to form an instrument blank, followed by twisting at low temperature.